The Strategic Vision of the United States Ordnance Corps

Maintain, Arm, Protect the Future Force

January 2016

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FOREWORD

Our Ordnance Corps can trace its heritage back to the very beginnings of our nation to the gunsmiths who armed colonial militias during the Revolutionary War. From its inception as the Ordnance Department during the War of 1812 to the recent wars in Afghanistan and Iraq, the Ordnance Corps has developed Soldiers and dedicated Civilians into trusted professionals who generate and maintain combat power for our Soldiers. These trusted professionals are agile and innovative because they understand their responsibility to be experts in our core competencies.

The only thing we are sure of for the future is that it will remain uncertain and that it is constantly changing.

To continue producing trusted Ordnance professionals who are experts in our core competencies and support the Army as a whole to meet this future, we will concentrate on incorporating Ordnance elements into these 5 concepts:

1. Optimizing Soldier and Team Performance
2. Joint/Interorganizational Interoperability
3. Adaptive Professionals and Institutions to operate in complex environments
4. Scalable and Tailorable Joint Combined Arms Forces
5. Capabilities Overmatch

The purpose of this strategic vision is to provide some guardrails for our Soldiers on the road to change and inform the Corps in its constant adaptation.

With the Army currently stationed and deployed around the world, our Corps maintains the Army to deter adversaries, provide its lethality through arms sustainment, and protect the Army against conventional and hybrid threats.

By maintaining, arming, and protecting, the Ordnance Corps enables the unified action necessary for the Army to **win in a complex world**. Our Corps is the Armament for Peace, developing an arsenal of democracy; a key sustainment war-fighting function, to ensure our Army can deploy, survive, fight and win in every environment. I look forward to leading such a proven organization into the future. May God bless our Ordnance Corps, our Army, and our Nation.

Kurt J. Ryan, 39th Chief of Ordnance
Brigadier General, U.S. Army
39th Chief of Ordnance

CONTENTS

PREFACE

ORDNANCE STRATEGIC VISION (OSV)

i. Purpose of the OSV:

The OSV provides the direction for the Ordnance Corps by enumerating both our core ideology and the Ordnance Corps' impacts from the future operating environment envisioned in the Army Operating Concept: Win in a Complex World 2020-2040 (AOC). The core ideology portion of the OSV, made up our core values and core purpose, is enduring by nature while the future envisioned within the AOC is ever-changing and thus calls for broad Lines of Effort to allow flexibility to meet them.
The OSV is also nested with the Army's Campaign of Learning, which provides context and direction on how the future force will win in a complex world by addressing 20 identified Army Warfighting Challenges (AWC). Our OSV will primarily focus on AWC number sixteen and its ten learning demands, though it will also directly and indirectly inform all AWCs.

ii. Components of the OSV:

Our Ordnance strategic vision is governed by two parts, 1) our *core ideology*, and 2) an *envisioned future*.

The *core ideology* of an organization is resolute and unchanging and allows the organization to remain true to itself through changes in leadership, environment, and unforeseen challenges. Our ideology is built around values, describing what we stand for, and purpose; our reason for existence. Our *envisioned future* provides a vivid description of how we are going to achieve our goals over the next 15 years.

Together, the core ideology and the envisioned future, provide the balance and approach to developing a strategic vision.

iii. Structure of the Envisioned Future:

The OSV presented here will focus on tangible solutions designed to be achievable within 15 years. It is formulated from the current AOC*,* the Army Vision *Strategic Advantage in a Complex World,* and the Army's Campaign of Learning *Force 2025 Maneuvers.* Each of these strategic visionary documents provide the starting point for developing the learning the demands required for the future Ordnance Corps.

1. UNITED STATES ARMY ORDNANCE CORPS

1.1 Ordnance Corps Mission:

To provide munitions, maintenance, explosives safety and Explosive Ordnance Disposal (EOD) support, to generate and maintain combat power and to provide protection to the Army, Joint, interagency, intergovernmental, and multinational forces.[1]

1.2 Ordnance Corps School Mission:

Train Ordnance Soldiers in technical skills, values, common tasks, and the Warrior Ethos. Supports development of Doctrine, Organizational, Training, Materiel, Leadership & Education, Personnel, and Facilities – Policy (DOTMLPF-P) capabilities that provide effective and efficient maintenance, munitions, and EOD protection support to the Army. Support the Army's enlisted and officer accession mission.[2]

1.3 Ordnance Corps Ideology:

Our ideology is what defines the Ordnance Corps. It is unchanging and allows the Ordnance Corps to be true to itself as leaders, methodology, technology, and innovation change the environment around it. The ideology finds its bedrock within our Ordnance values and purpose. Ordnance values are proven and timeless guiding principles for Ordnance Soldiers and Civilians.[3] Our purpose defines the reason for why our Ordnance Corps exists.

1.3.1 Ordnance Corps Values:

Warriors First, Technicians second to none
Trusted professionals
Agile and innovative leaders
Experts of core competencies
Resilient and respectful
Expeditionary Mindset

1.3.2 Ordnance Corps Purpose: Provide professional, innovative, and agile logisticians to generate and maintain combat power, and to protect the Army, Joint, interorganizational, and multinational forces.

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[1] US, Department of the Army, *FM 4-30, Ordnance Operations* (Washington, DC: Government Printing Office, April 2014), 1-1.
[2] US, Department of the Army, *TRADOC Regulation 10-5-5, Organization and Functions United States Army Combined Arms Command and Sustainment Center of Excellence* (Fort Monroe, Virginia: Training and Doctrine Command, September 2010), 85.
[3] Harvard Business Review, *Building Your Company Vision* (Watertown, MA: Harvard Business Publishing, 1996) online at <https://hbr.org/1996/09/building-your-companys-vision>; accessed (June 2015).

2. THE ENVISIONED FUTURE

"The future environment demands that we be globally responsible and postured to rapidly deploy, fight and win, whenever and wherever our national interests are threatened. We will reestablish an expeditionary mindset by improving our capabilities to project power and, if necessary, conduct forced entry into denied areas, under austere conditions anywhere in the world."

- General Raymond Odierno, AUSA, October 2013

2.1 The Sustainment Warfighting Function:

Ordnance Soldiers and Civilians play a critical role in executing the sustainment warfighting function (SWfF). This function is the capstone concept for the Army's sustainment enterprise and provides operational and organizational concepts for the Joint Logistics Enterprise (JLE).
As a member of each enterprise, the Ordnance Corps provides logistical overmatch to ensure U.S. strategic advantage. By doing so, the sustainment warfighting function enables the Joint Force Commander freedom of action, and operational reach through continuity of operations. This presents multiple options for the Joint Force Commander and multiple dilemmas for the adversary.

2.2 Lens of the Envisioned Future: The ***"BIG FIVE"***

1. *Optimized Soldiers and Team Performance*
2. *Joint/Interorganizational Interoperable*
3. *Adaptive Professionals and Institutions to operate in a complex world*
4. *Scalable and Tailorable Joint Combined Arms Forces*
5. *Capabilities Overmatch*

2.2.1 Optimized Soldiers and Team Performance: In order to maintain, arm, and protect the future Army, Ordnance Soldiers and teams will optimize their performance by achieving ***cognitive dominance***, ***executing realistic training***, and ***driving institutional agility*****.**

(2.2.1) Optimized Soldiers and Team Performance

The Louisiana Maneuvers, in 1941, focused on realistic training to evaluate all aspects of combat effectiveness and sustainment.

By 1941, the War Department was well on its way to full mobilization. Realistic training became a top concern. Since the end of World War I, There had been no Army exercises to thoroughly test and train American Soldiers. The Louisiana Maneuvers, led by BG Leslie J. McNair, were designed to solve the problem. The training maneuvers were the most realistic, largest-scale war games the American Army had ever held. The maneuvers thoroughly tested American doctrine, equipment and organization, from the emergent concepts of combined-arms warfare down to the new C-Rations. It also gave the senior Army leaders a chance to evaluate upcoming field grade officers

Cognitive dominance is a position of intellectual advantage over a situation or adversary that advances proactive agility over reactive adaptation, facilitating the ability to anticipate change before it occurs.

Building optimized teams requires tough, realistic and ethically challenging training that not only fully replicates the physical stress of combat, but the social and cultural aspects as well.

Driving institutional agility is the ability for institutions to anticipate changing conditions in stride, lead through innovation, develop a culture that values life-long learning, and demonstrates crucial capabilities in advance of requirements.[4]

Achieving cognitive dominance requires executing realistic training and driving institutional agility to be focused around three tenets; leader development, physical supremacy, and the Army profession.

2.2.1.1 Leader development across all cohorts must possess the characteristics of agility, innovation, critical thinking, and adaptation.

[4] LTG Robert B. Brown, *The Human Dimension, A Framework for Optimizing Human Performance,* (Fort Leavenworth, KS: United States Army Combined Arms Center, 2014), 15.

2.2.1.2 Physical supremacy is the second tenet of optimized performance which upholds the characteristics of total fitness and resiliency. Ordnance Soldiers and teams must be physically, emotionally, and psychologically strong to optimize performance, this is accomplished by fostering organizational environments that are ready and resilient.

	The "Basics" Then 1944-2001	The "Basics" Now 2014-Future
Shoot	- Effectively Engage Targets - Accuracy and precision - Hit targets with iron sights	- Increasing importance of discriminate fires - More complex rules of engagement - Split-second decisions to use force or not - Increased use of optics/ night vision
Move	- Squad/Platoon Battle Drills - Situational awareness derived from a map - Company AO may include several grid squares - Operate in difficult terrain	- Dispersed, independent movements - Situational awareness derived from a COP (common operating picture) - Company AO may include multiple districts and villages (larger than a battalion AO in the past) - Operate among the people in complex societies in any terrain
Communicate	- FM Radio Procedures - Military to military	- Voice and Digital networks - Host nation, media, Interagency - Cultural awareness, negotiations, social media - Matching actions to words - Winning the battle of the narrative
Physical Fitness	- Basic physical conditioning (push-ups, sit-ups, 2 mile run)	- Total Fitness (physical, mental, social, resilience)
Discipline	- Do the right thing when no one is watching	- Do the right thing as the whole world is watching

2.2.1.3 Army profession characteristics are character, commitment, and competence within the realm of optimization of Soldiers and teams. Ordnance professionals are technical masters of their skill, and will demonstrate their mastery through the characteristics of the Army profession.

Achieving ***cognitive dominance*** is an enduring effort to optimize Ordnance Soldiers and teams. In the near-term (5 to 10 years), the Ordnance Corps will **adapt** cognitive dominance to our currently evolving operating environment, in the mid-term (10 years) it will **evolve**, and through the far-term (30 years) it will drive **innovation.**

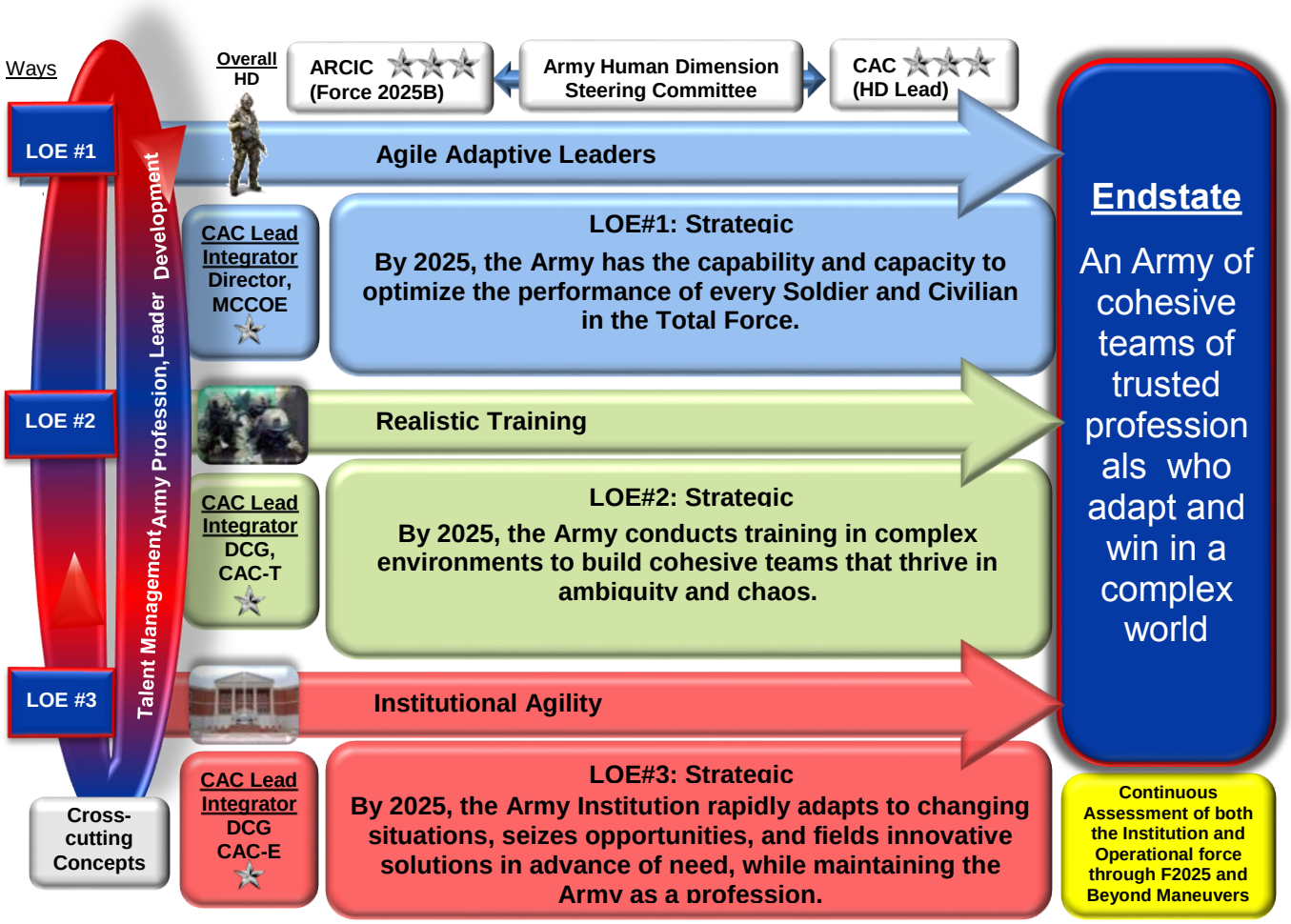
Ordnance Soldiers and Civilians can optimize their individual performance now by adapting to the current operating environment to optimize team and organizational performance. This adaption will combat stress in a complex world which is constantly changing.

To capture individual and team performance, ***performance metrics*** must be created and then applied to the institutional and operational domains. The purpose of capturing performance metrics is to evaluate whether or not the Ordnance Corps is producing Soldiers, Civilians, and teams that can **thrive** in uncertain and chaotic environments.

Additionally during the future operational environment, ***new incentives*** must be discovered and adopted to drive individual development. Incentives are critical to the optimization of Soldier and team performance, since they provide increased motivation, increased productivity, and increased team work. Incentives are not necessarily monetary; but incentive for self-development and personal growth to optimize performance.

For Ordnance Civilians, future Ordnance Corps operations will continue to ***support the civilian education system*** (CES) and the Army Civilian Training, Education, and Development System (ACTEDS). CES and ACTEDS allows Civilians to gain the education and leadership skills to enhance the cognitive dominance of the Corps.

Adapting cognitive dominance in the future environment also requires a ***retention of skills, and experiences***. Skills learned and experiences provide the foundation for Soldier and team adaptation towards cognitive dominance. In order to ensure that skills are retained in each of the core competencies, ***theory based proficiency tests*** must be created and implemented over the career progression of a Soldier based on MOS and rank. Theory based proficiency tests will build on what has been achieved through skills-based assessments to drive the cognitive growth of the Soldier. To give significance to the importance of theory based proficiency tests, results will be accounted for on Soldier and civilian annual evaluations and if applicable used to inform career progression and talent management. Theory based proficiency tests will ensure the Ordnance Corps retains its technical expertise in a complex world.



Through the mid-term, Ordnance Soldiers, Civilians, and teams will evolve their cognitive dominance to continue optimization of performance. Evolution of cognitive dominance will take the foundation of what was learned and retrained through adaptation, to propel Ordnance Soldiers and Civilians to lead agile and versatile teams. As the principal agent for Army maintenance, ammunition, explosives safety, and explosive ordnance disposal operations, the Ordnance Corps will grow the ***interoperability of its core competencies***. This will be achieved by strengthening the doctrinal relationships between all the Centers of Excellence, to enable the sustainment

enterprise to support expeditionary joint combined arms maneuver. Ordnance Soldiers and Civilians will enter and participate in sister service sustainment schools and or have sister service doctrine and training incorporated into existing Ordnance Program of Instruction (POI) at all levels. Secondly, Ordnance Soldiers and Civilians will ***expand their JIIM understanding and interoperability***, by including JIIM based training, simulations, and experiences to optimize their performance in sustaining joint combined arms maneuver. Lastly as a technical branch, Ordnance Soldiers and Civilians must be selected and **assigned *to organizations that govern the modernization of the Army*** across the DOTMLPF-P domains.

During the mid-term the Ordnance Corps will continue to enhance the situational understanding of Soldiers and Civilians, to enable them to make rapid and accurate decisions. Enhancing situational understanding will be particularly key for the ***indoctrination and training of Generation Z.*** "Researchers continue to document…the way people, particularly young adults, learn by enhancing their ability to handle intangibles. Second, researchers predict continuing difficultly with a recruit-age population lacking basic skills (mathematics, reading, and writing at or below the 8th

grade level).[5] To insure evolution of cognitive dominance for Generation Z, the Ordnance Corps must develop new techniques, tools, and systems to rapidly optimize the cognitive growth of future Ordnance Soldiers and Civilians during the mid-term.

Realistic Training is a continuous effort by Ordnance Soldiers and Civilians to conduct rigorous training that incorporates the complexities of the human dimension. By replicating combat stress and the social and cultural aspects of it in realistic training, Ordnance Soldiers and Civilians will build effective and cohesive teams built on trust and respect. Training will adapt in the near-term to combat today's complexities, evolve over the mid-term, and innovate through the far-term.

Generating and sustaining realistic training will be difficult since the world is complex, and future adversaries are unknown, unknowable and ever changing. However, the Army Operating Concept: *Win in a Complex World* does provide Ordnance leaders the framework for winning in a complex world. Ordnance Soldiers and Civilians must understand future adversaries will present multiple dilemmas to Joint Force Commanders, and therefore Ordnance Soldiers and Civilians must be able to provide multiple sustainment options to enable joint combined arms maneuver during unified land operations.

The Ordnance Corps must review ***home station training and institutional training*** of each of its core competencies and ask the following questions:

- Does this training support expeditionary joint combined arms maneuver?
- Does this training provide ethical challenges for Soldiers and Civilians?
- Does this training facilitate critical thinking for leaders to rapidly assess and make decisions using disciplined initiative?
- Does this training drive innovative thinking by allowing multiple options and solutions for one problem set?
- Does this training replicate sustainment operations in an austere environment across contested lines of communication?
- Does training environments incorporate the 'Total Force' (A/C, USAR, ARNG)?

These are only a few of the questions that should be asked when assessing home station and institutional training. The questions presented provide the theme and messaging for the type of training the Ordnance Corps needs to invest in to optimize Soldier and Civilian performance, and build effective teams that can win in a complex world. The assessment of home station and institutional training will then drive institutional agility.

Drive institutional Agility is "the ability of the larger Army institutions to anticipate changing conditions in stride, lead through innovation, develop a culture that values life-long learning, and demonstrate crucial capabilities in advance of need."[6] This ability to anticipate changing conditions is harnessed within the Army's campaign of learning:

[5] LTG Robert B. Brown, *The Human Dimension, A Framework for Optimizing Human Performance*, (Fort Leavenworth, KS: United States Army Combined Arms Center, 2014), 13.
[6] Ibid. 15

"Cultural change begins with behavior and the leaders who shape it. We must be prepared to question everything"

-MG(R) David Fastabend

Force 2025 Maneuvers (F2025M). F2025M facilitates intellec tual and physical activities to develop, refine, and validate requirements for Force 2025 and Beyond (F2025B) concepts, operational and organization plans, and DOTMLPF prerequisites. The learning framework for F2025M is the Army Warfighting Challenges (AWFC), which are enduring first-order problems, the solutions to which improve the combat readiness and effectiveness of the current and future force.

As a member of the sustainment enterprise and in collaboration with the Sustainment Center of Excellence (SCoE)/Combined Arms Support Command (CASCOM), the Ordnance Corps participates in the study of all twenty AWCs as its core competencies apply to optimizing Soldiers, Civilians, and teams.

In the context of teams, ***manned and unmanned teaming*** (MUM-T) will continue to grow and develop within the core competencies of the Ordnance Corps. These teams will utilize autonomous vehicles and platforms to minimize the presence and requirements of Ordnance Soldiers on the battlefield. MUM-T will optimize the performance of maintenance, EOD and ammunition teams by reducing their logistical footprint, while enhancing operational reach and depth for the future force. As one of the larger Army institutions, the Ordnance Corps must drive innovation and provide the cognitive agility to facilitate MUM-T across DOTMLPF domains.

A current technique in optimizing Soldier performance is through the ***Army Credentialing Program***, where the Ordnance Corps is leveraging its institutional agility as one of the Army's leaders of this effort. Ordnance Soldiers are technical experts and civilian credentialing will assist in optimizing their performance.

As an institution that constantly anticipates changing conditions, the Ordnance Corps must stay abreast of ***Brigade Combat Team (BCT) modernization efforts***. To date, almost every formation in the Army has an Ordnance Soldier or Civilian, in order to maintain, arm, and protect Army formations. In the near-term the Ordnance Corps will address the requirements, capabilities and impacts for a **vehicle recovery strategy for Force 2025** and beyond. Future Army formations will have different capabilities and mission sets, the Ordnance Corps must identify the correct MOS and provide the Soldier with the correct equipment to maintain, arm, and protect the future force. Examples of this identification are:

Does the consolidation of recovery and Battle Damage Assessment and Repair (BDAR) into a single MOS vice an ASI management provide the Joint Force Commander greater capability?

With autonomous equipment having an emerging and greater role, what is the correct repair specialist MOS for autonomous equipment repair?

2.2.2 Joint/Interorganizational Interoperable: Leaders and systems operate in a joint, interagency, intergovernmental, and multinational (JIIM) environment to create multiple dilemmas against adversaries to win during unified land operations.

(2.2.2) Joint/Interorganizational Interoperable

CJTF-76, Task Force Troy, in Baghdad was established to focus on combating IEDs during Operation Iraqi Freedom:

During the early phases of Operation Iraqi Freedom, the improvised Explosive Device (IED) was the weapon of choice of anti-coalition forces. It became a highly effective, low technology weapon which proved hard to exploit and defeat.

Combined Joint Task Force Troy (CJTF-Troy) was designed to combine expertise, experience, and efforts of coalition allies to defeat the threat. The mission was to exercise command and control of specialized counter-IED forces, coordinate synchronized efforts focused on IED intelligence collection and development and material solutions to address the threats, and provide training throughout the region in order to defeat the IED threat. CJTF-Troy included units specializing in explosive ordnance disposal, weapons intelligence, and explosives exploitation. The joint effort included the British, Australian, and Iraqi forces. During its tenure, the task force became the IED experts in Iraq and assisted and trained coalition efforts to defeat the IED threat throughout Iraq.



The Joint force gains its strength through the ability to combine capabilities from services and mission partners across domains, organizational cohorts, echelons, and geographic boundaries in order to provide the elements of integrated operations:

1) Mission Command
2) Seize, retain and exploit the initiative
3) Global agility
4) Partnering
5) Flexibility in establishing Joint forces
6) Cross-domain synergy
7) Use of flexible, low signature capabilities
8) Increasingly discriminate to minimize unintended consequences[7]

The Ordnance Corps is an essential member of the Army's sustainment enterprise and contributor to the Joint Logistics Enterprise. The core competencies of the Ordnance Corps must adapt, evolve and innovate to provide the Joint Force the endurance and

[7] US, Department of Defense, *Capstone Concept for Joint Operations: Joint Force 2020* (Washington, DC: Joint Chiefs of Staff, September 2012), 4.

depth to win decisively. Adaptation, evolution and innovation of the core competencies will focus around mission command, partnering, and cross-domain synergy.

"We must ensure the Army remains ready as the world's premier combat force. Readiness for ground combat is – and will – remain the U.S. Army's #1 priority... and there is no other #1"

-Gen Mark Milley

Mission command systems will be critical to the success of Ordnance Soldiers and teams operating in an expeditionary environment. These systems will interface throughout the common operating environment to provide real-time transit visibility, asset location, materiel readiness levels, and a shared understanding. As the provider of the Army's lethality, the Ordnance Corps must invest in bridging the gap between the Global Combat Support System-Army (GCSS-Army) and ***automation of the ammunition supply activity*** to adapt in the near-term. This bridge must include the capability of providing a shared understanding of munitions across the Joint Force. By creating a joint shared understanding of munitions across the Joint Force, it will foster interoperability and use of munitions during unified land operations.

In the near-term the Ordnance Corps will continue to work towards bridging the gap of end-to-end system infrastructure to efficiently collect, store, and transmit the platform-generated data necessary to ***perform conditions based maintenance plus*** (CBM+) and fleet lifecycle management in the Enterprise.[8] CBM+ will function within the common operating environment and provide the Army and the Joint Force Commander greater visibility and a shared understanding towards materiel readiness. In addition to bridging this gap, the Ordnance Corps will ***develop the ammunition automation for*** **GCSS-Army**. This is required since current systems cannot meet Joint Forces ammunition needs in an enterprise environment.

The Ordnance Corps will capitalize on ***virtual presence technology*** in the mid-term to evolve the core competencies interorganizational and interoperability capabilities. Virtual presence technology will allow Ordnance Soldiers, Civilians, and teams to actively engage and provide a shared understanding with enablers. This will be especially true since forces will be CONUS based, and are regionally aligned to operate in austere circumstances. While operating in an expeditionary environment with extended and contested lines of communication, this

[8] Program Executive Office Enterprise Information Systems, *Problem Statement: Condition Based Maintenance Plus (CBM+) Store and Forward (SaF),* (Fort Lee, VA: CASCOM Enterprise Systems Directorate, February 2015), 10.

technology will help to minimize the logistical footprint.

Partnering with Joint and interorganizational forces will be essential for Ordnance Soldiers, Civilians, and teams sustaining in complex world. EOD, ***partnering with United States Special Operations Command*** (USSOCOM) in the near-term will build the desired interoperability for the Joint Force, and provide additional options to combat adversaries who present multiple dilemmas.

Over the mid-term, the Ordnance Corps will ***partner with multination/allied forces*** to further the shared understanding of its core competency's operational and organizational concepts. Since the future is unknown and unknowable, maintenance, ammunition, and protection partnering will be invested in to build the joint and interorganizational interoperability of the Ordnance Corps.

Cross-domain synergy will improve the protection of the force in every domain, while defeating anti-access efforts from adversaries. In the mid-term the Ordnance Corps will leverage its core competencies to the Joint Force as ***Army Support to Other Services (ASOS)***. As the principle agent for maintenance for the Army, the Ordnance Corps will leverage its interoperability to drive cross-domain synergy for maintenance operations during unified land operations. The Ordnance Corps will provide the technical and knowledge base to conduct expeditionary maintenance to maintain the ground forces of the Joint Force. With respect to munitions operations, Ordnance leaders across the total force must be ready to plan, coordinate, resource munitions support to joint operations or multinational partners. Therefore, during the mid-term new POIs will be introduced to account for sister service munition procurement, storage, transportation, and accountability. Additional consideration and training will be given to North Atlantic Treaty Organization (NATO) munition capabilities and requirements for multinational partner weapon systems, in particular Australia, Canada, New Zealand, and the United Kingdom under the "Five Eyes" (FVEY) alliance.

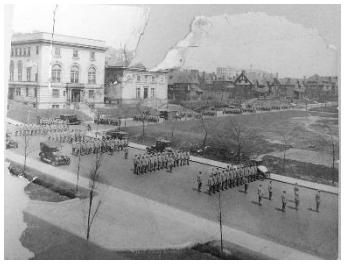
2.2.3 Adaptive Professionals and Institutions to Operate in a Complex World:

The future is unknown, unknowable and ever changing. In order to maintain a position of relative advantage against adversaries, professionals and institutions will drive adaptation and learning.

(2.2.3) Adaptive Professionals and Institutions to Operate in a Complex World

When the United States entered WWI, in 1917, no formal Ordnance school existed. In previous wars, the demand for skilled Ordnance technicians was met by identifying Soldiers who already possessed skills when they entered the Army.

By April 1917, obtaining trained Ordnance Soldiers was woefully inadequate. After the declaration of war, on April 6, the Council of National defense, in conjunction with the Ordnance Department, addressed the issue. The solution was to establish schools at various universities across the country. Courses were set-up, immediately, and students were enrolled. The University of Michigan began the first course, on April 20th. Within weeks, thirteen universities were providing courses, where they would go on to train more than 3,000 officers and Soldiers.



Sustaining a culture of adaptation through a campaign of learning is indicative of professionals and institutions, since adversaries will copy the Army's strengths, while developing asymmetric strategies to defeat them. To assure overmatch against threats, professionals and institutions must be superior in the art of learning and adaptation.[9]

As an adaptive institution, the mission of the Ordnance School is to *train Ordnance Soldiers, leaders, and Civilians in technical skills, values, common tasks, and the warrior ethos* across the total force. Training adaptive professionals will adapt in the near-term and evolve technical skills and common tasks over the mid-term. "The current strategic environment seems more ambiguous, presenting multiple layers of complexity and a multiplicity of actors challenging the Army requirements beyond traditional warfighting skills and training."[10] Challengers will attempt to achieve overmatch against the advantages of the Army, however the Army will retain superiority in the art of learning and adaptation.[11] The Ordnance School will retain its superiority in the art of learning and adaption through its campaign of learning, nested within the Army's campaign of learning.

The Ordnance School (ODS) will leverage its learning networks (*Sustainment Unit One Stop*, *eOrdnanceU*, *SKN OD Knowledge center*, etc.); proving technology with a purpose, as well as Army learning networks, to push information to retain superiority in training adaptive professionals across the total force. Information pushes however must be tempered with judgment by asking who else needs to know and why are we pushing this information.[12] In the near-term ODS will identify different ***methods to transfer and infuse knowledge*/training to the total force**.

The ODS will enable the total force through programs such as

- **Regional Training Site-Maintenance (RTS-M)** – Multiple TRADOC accredited RTS-Ms located across the country provide RC commanders local access to the finest of institutional maintenance training. RTS-M training location that supports your mission requirements at: (http://www.goordnance.army.mil/odschoomap/ODschoolMap.html)

- **Credentialing** - Creating successful credentialing opportunities for Ordnance Soldiers allows us to evolve and innovate additional credentialing opportunities. To broaden and expand credentialing across the core competencies we will focus Reserve Component Office (RCO) on leveraging our RTS-M capabilities. As an example, the RCO centrally manages ASE credentialing vouchers for the RTS-Ms, which in turn support ASE testing for active and reserve component

[9] MG(R) David A. Fastabend, *Adapt or Die, The Imperative for a Culture of Innovation in the United States Army.* online at < http://www.au.af.mil/au/awc/awcgate/army/culture_of_innovation.pdf > accessed on (June 2015).
[10] US, Department of the Army, *Operational environments to 2028: The Strategic Environment for Unified Land Operations*, (Fort Monroe, VA: Training and Doctrine Command G-2, August 2012), 13.
[11]MG(R) David A. Fastabend, Adapt or Die, The Imperative for a Culture of Innovation in the United States Army. online at < http://www.au.af.mil/au/awc/awcgate/army/culture_of_innovation.pdf > accessed on (June 2015), 2.
[12]Ibid, 10.

students in the geographical area who are attending their institutional training courses.

- **Command Maintenance Discipline Program (CMDP) Knowledge Center:** RC leaders and maintainers can leverage the CMDP Knowledge Center for the latest CMDP tools, virtual library, and best practices in a wide variety of maintenance focus areas.

During the near-term, the ODS will ***assess emerging learning methods and future technologies*** that are successful in academia and how best to incorporate them into training adaptive professionals.

Over the mid-term, ODS will continually assess the complexity of where Ordnance Soldiers, Civilians and teams will operate to adapt new challenges. This continual assessment will drive interoperability across all Centers of Excellence (CoE) on how Ordnance core competencies interface with the warfighting functions. The Army's campaign of learning F2025M will be the vehicle for this assessment. As an adaptive intuition addressing complex environments, ODS will drive early ***input to the Life Cycle Support Plan (LCSP) and integration into combat system development***.

As the executive agent for maintenance operations for the Army, ODS will evolve the ***training for autonomous systems maintenance*** over the mid-term**.** As the lead for autonomous maintenance, ODS will drive the knowledge and its interoperability across all CoEs and services. In addition to autonomous maintenance, ODS will apply ***the effects of skill based training towards emerging and future combat systems***, such as the joint-light tactical vehicle (JLTV); ultra-light combat vehicle (ULCV) family and energy systems to include the High Energy Laser Technology Demonstrator (HEL-TD).[13]

2.2.4 Scalable and Tailorable Joint Combined Arms Forces:

Joint combined arms maneuver during unified land operations will require forces to be scalable and tailorable to mission sets. Ordnance Corps Soldiers must become experts in our core competencies, both individually and in formations, in order to provide flexible use of our capabilities as needed in tailored package forces.

The characteristics of scalable and tailorable forces are ***interoperability, expeditionary, versatility, and balance.*** These characteristics will allow the continued modularity of formations echeloned below brigade, increased delegation of authority to junior commands, partnering with governmental and allied organizations, and merging components under one command as needed.[14]

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[13] Gene J. Koprowski. FoxNews site. *Ray Guns Real: Army Betting Big on Laser Weapons.* Online at <http://www.foxnews.com/tech/2010/01/12/army-building-ultra-high-power-laser-guns >accessed on (June 2015).

[14] US, Department of the Army, *The Army Vision, Strategic Advantage in a Complex World,* (Washington, DC: Government Printing Office, 2015), 10.

(2.2.4) Scalable and Tailorable Joint Combine Arms Forces

In WWII, Bomb Disposal Squads (BDS) participated as members of special 'T-Force' groups, attaching fortifications along the Rhine. Although it was not part of their planning, they served as explosives experts and any other mission they were tasked with.

The Ordnance Department established its core competency with the creation of the Bomb Disposal School at Aberdeen Proving Ground, under Lieutenant Colonel Thomas Kane. Formed at the outset of the war, the BDS defused unexplored, Japanese, aerial bombs during the attack at Perl Harbor.

As WWII progressed, BDS were called upon to do a variety of missions beyond the original concept. One of the unique missions for a BDS was to participate with the 'T-force', an ad hoc task force assembled for unique missions. On February 9, 1945, the 16th BDS participated in the attack on Schwammenauel Dam with the 311th Infantry Regiment of the 78th Division. By the end of the war, the squads had operated close to the front line, moving often with forward line of battle and coming under attack.

The characteristics of scalable and tailorable forces are ***interoperability, expeditionary versatility, and balance.*** These characteristics will allow the continued modularity of formations echeloned below brigade, increased delegation of authority to junior commands, partnering with governmental and allied organizations, and merging components under one command as needed.[15]

Scalable and tailorable forces counter the effects of a continued drawdown of the Army's strength and continued fiscal constraints. These forces provide multiple options for Joint Force Commanders to present multiple dilemmas to future adversaries or adjust to non-standard, non-kinetic missions.

The Ordnance Corps is a force provider and generator that will enable scalable and tailorable forces for the Joint Force Commander. By doing so the Ordnance Corps will review the modularity of formations echeloned below brigade, to what types of Ordnance professionals will be needed to provide the Joint Force the interoperability and versatility to win in a complex world. Formations echeloned below brigade will provide unique capabilities with a minimal footprint to apply the required effects during each phase of joint combined arms maneuver. Using the AWCs within the Army's campaign of learning F2025M, the Ordnance Corps will identify the role of its professionals as applicable to each core competency.

[15] US, Department of the Army, *The Army Vision, Strategic Advantage in a Complex World,* (Washington, DC: Government Printing Office, 2015), 10.

Explosive Ordnance Disposal technicians will face increasingly complex hybrid threats from adversaries seeking anti access and area denial (A2AD) to Joint Forces. These threats will encompass the entire domain of chemical, biological, radiological, nuclear, and explosive (CBRNE). In the near-term EOD technicians will build out their ***interoperability across the Joint Force*** to leverage their skills in a special purpose joint task force[16] as required by the Joint Force Commander. As a force enabler who will defeat A2AD threats, EOD technicians will play a critical role in scalable and tailorable joint combined arms forces.

As the chief agent for Army munitions and potentially for the Joint Force Commander, the Ordnance Corps has the responsibility of identifying how automated ammunition supply activities will be deployed, sustained, and then retrograded during unified land operations. ***Automated Ammunition Supply Points (AASP)*** will play a critical role for the Joint Force Commander who will require AASPs to be scalable and tailorable to sustain the Joint Force over extended lines of communication. The Ordnance Corps in the mid-term will generate modular AASPs that are rapidly deployable and can operate in an expeditionary environment with a minimal footprint.
The Ordnance Corps is the third largest branch in the Army, however the Army is drawing down to a total force of 450,000 active component and 900,000 total force. The Ordnance Corps will address in the near-term where ***Ordnance professionals will be placed in organizations echeloned below brigade***. The Army will continue to modularize its formations to achieve scalable and tailorable forces, therefore the Ordnance Cops must conduct cost-based analysis on what types of MOS's will render the most efficient maintenance support to keep building and sustaining readiness.

2.2.5 Capabilities Overmatch: This is the application of capabilities or use of tactics in a way that renders an adversary unable to respond effectively. Our goal is always to provide a capabilities overmatch for the combatant commander by acting as a force multiplier in our sustainment roles.

To prevent enemy overmatch, the Army must develop new capabilities while anticipating enemy efforts to emulate or disrupt those capabilities. To retain overmatch, the Army will have to combine technologies and integrate efforts across multiple domains to present adversaries with multiple dilemmas. [17]

In the near-term, the Ordnance Corps will ***invest in new ultralight, durable and reusable ammunition packaging capability*** to decrease the sustainment footprint in an expeditionary environment. Leveraging new materials to replace conventional

[16] US, Department of the Army, *Army Training Publication 4-32: Explosive Ordnance Disposal (EOD) Operations,* (Washington, DC: Government Printing Office, September 2013), 2-8.
[17] US, Department of the Army, *TRADOC Pamphlet 525-3-1, The U.S. Army Operating Concept: Win in a Complex World,* (Fort Monroe, VA: Training and Doctrine Command, October 2014), 9.

ammunition packaging will render the desired effect of a rapidly deployable ammunition supply point (ASP). Over the mid-term, the Ordnance Corps will develop and field ***autonomous ammunition distribution vehicles***, which will be a capability overmatch over contested lines of communication.

(2.2.5) Capabilities Overmatch

At the start of Operation Desert Storm, Saddam Hussein depended heavily on his network of deeply buried bunkers. Targeting the bunkers was a high priority. Yet, the deepest of the bunkers lay beyond the capability of Allied munition, so thee bunkers remained operational, despite multiple strikes.

On January 25, 1991 Gerry Yarter, at Wateryliet Arsenal, received a telephone call from Lockheed Missile and Space They were looking for assistance in the production of a weapon that could penetrate Saddam's deep bunkers. Yarter assembled a team and worked around the clock on the production of the bomb. They determined that the barrels of obsolete M1 10/8 inch howitzers could be cut and redesigned to serve as the body of the new 5,000 pound bombs. The first two GBU-28s, 'bunker busters', were ready for testing by February 17. Then on February 27, two GBU-28s were dropped and destroyed the underground bunker. Hussein's capability to take sanctuary in deep bunkers was defeated.

During the mid-term, EOD technicians will be fielded with mission command systems that will enable their interoperability across the Joint Force. These ***EOD mission command systems*** will be embedded into the common operating environment, to provide critical, real time information against Anti-A2AD threats by contributing to a shared understanding amongst the Joint Force. In order to do this, EOD teams must be fielded with fly-away communication systems that are rapidly deployable and can operate in austere environments as stand-alone systems. This will aid in their ability to communicate and sustain JIIM partner dependency. In the near-term, continuous ***adaptation of autonomous vehicles*** must be rendered to defeat current threats against the Joint Force that can thrive in austere environments to mega cities.

Within the realm of maintenance operations, the Ordnance Corps will drive the adaption and then evolution towards a ***single recovery platform*** during the mid-term. A single recovery platform will meet the requirements of being rapidly deployable and can operate in the most austere expeditionary environment. This platform will provide a capability overmatch by being able to recover all current and future vehicles in the Army's inventory, to include downed aircraft. A single recovery platform that can recover all Army vehicles, to include joint/allied vehicles, will reduce the logistical footprint of the joint force and provide the flexibility and versatility of sustainment capability overmatch for the Joint Force Commander.

In the near-term ***sensor technology*** will be leveraged for vehicles that will be operating in an expeditionary environment that will transmit data to feed into the common operating environment. The Ordnance Corps will identify the attributes and

characteristics of sensors and prioritize what platforms/systems require sensors to enhance the efficiency of CBM+.

Additionally during the mid-term, the Ordnance Corps will become the Army's ***proponent for additive manufacturing*.** Additive manufacturing will revolutionize how the Army and the Joint Force is sustained, by decreasing the logistical footprint and allow freedom of movement for joint combined arms maneuver with prolonged endurance. In the near-term, the Ordnance Corps must become the chief advocate for additive manufacturing by leveraging its interoperability with industry. Additive manufacturing will become a game changing sustainment overmatch capability that will present multiple options for the Joint Force Commander.

As the maintainer of the Army's and Joint Force's operational energy, the Ordnance Corps will ***invest in training and maintenance of intelligent power and distribution***. During the near-term, the Ordnance Corps will identify emerging intelligent power and distribution systems to adapt current training of Ordnance Soldiers, to build the cognitive advantage in maintaining these systems. Over the mid-term, the Ordnance Corps will enhance intelligent power and distribution awareness through training, education and doctrine. The end state will influence the attitude and shape behaviors to create an environment in which every member of the Joint Force views energy as critical enabler and a capability overmatch.

3. THE FUTURE IS NOW

Ordnance Corps 2025 will effectively employ its core competencies, by maintaining, arming, and protecting the future force. Its ability to adapt in the near-term, evolve during the mid-term, and innovate through the far-term will provide the Army sustainment capabilities overmatch to prevent, shape and win our Nation's wars.

The Ordnance Corps is a balanced mix of versatile and expert Soldiers and Civilian professionals, who will drive adaptive institutions to optimize individual and team performance. By doing so, the Ordnance Corps will build out its interoperability throughout the Joint Force, by providing sustainment capabilities overmatch, while enabling scalable and tailorable forces. For over 203 years the Ordnance Corps has served our Nation, and earned the trust of its people by producing technically proficient professionals who maintain, arm, and protect our Army to win.

GO ORDNANCE!

LIST OF ACRONYMS & ABBREVIATIONS

A2AD	ACCESS & AREA DENIAL
AASP	AUTOMATED AMMUNITION SUPPLY POINTS
ACTEDS	ARMY CIVILIAN TRAINING, EDUCATION, & DEVELOPMENT SYSTEM
AOC	ARMY OPERATING CONCEPT
ASOS	ARMY SUPPORT TO OTHER SERVICES
AWC	ARMY WARFIGHTING CHALLENGES
BCT	BRIGADE COMBAT TEAM
BDAR	BATTLE DAMAGE ASSESSMENT & REPAIR
BDS	BOMB DISPOSAL SQUADS
CASCOM	COMBINED ARMS SUPPORT COMMAND
CBM+	CONDITIONS BASED MAINTENANCE PLUS
CBRNE	CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR, & EXPLOSIVE
CES	CIVILIAN EDUCATION SYSTEM
CMDP	COMMAND MAINTENANCE DISCIPLINE PROGRAM
COE	CENTERS OF EXCELLENCE
DOTMLPF-P	DOCTRINE, ORGIZATION, TRAINING, MATERIAL, LEADERSHIP & EDUCATION, PERSONNEL, FACILITIES - POLICY
EOD	EXPLOSIVE ORDNANCE DISPOSAL
F2025B	FORCE 2025 & BEYOND
F2025M	FORCE 2025 MANEUVERS
FVEY	FIVE EYES
GCSS-ARMY	GLOBAL COMBAT SUPPORT SYSTEM-ARMY
HEL-TD	HIGHT ENERGY TECHNOLOGY DEMONSTRATOR
JIIM	JOINT, INTERAGENCY, INTERGOVERNMENTAL, & MULTINATIONAL
JLE	JOINT LOGISTICS ENTERPRISE
JLTV	JOINT-LIGHT TACTICAL VEHICLE
LCSP	LIFE CYCLE SUPPORT PLAN
MUM-T	MANNED & UNMANNED TEAMING
NATO	NORTH ATLANTIC TREATY ORGANIZATION
ODS	ORDNANCE SCHOOL
OSV	ORDNANCE STRATEGIC VISION
POI	PROGRAM OF INSTRUCTION
RCO	RESERVE COMPONENT OFFICE
RTS-M	REGIONAL TRAINING SITE-MAINTENANCE
SCOE	SUSTAINMENT CENTER OF EXCELLENCE
SWFT	SUSTAINMENT WARFIGHTING FUNCTION
ULCV	ULTRA-LIGHT COMBAT VEHICLE
USSOCOM	UNITED STATES SPECIAL OPERATIONS COMMAND

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